

earth's magnetism is a maximum near the solstices, and a minimum near the equinoxes.

The diurnal variations of horizontal force, deduced from the photographic registration of the bifilar magnetometer, follow laws similar to those at Munich, and not differing greatly from those at Makerstoun,  $17^{\circ}$  further north; the minimum, however, shifting from near 9 A.M. in summer to about 2 P.M. in winter.

The balance magnetometer seems to be the least certain of the variation instruments at Lisbon. The temperature coefficient (obtained by heating the air with gas jets) has been found with an opposite sign to that due to variations of the needle's magnetism, a result which is always unsatisfactory even when the variations of temperature are small as they are at Lisbon. The diurnal variation of the vertical magnetic force differs considerably from that obtained at more northern observatories, the minimum occurring in each month of the year near noon, and the maximum near 5 P.M.

Mr. Capello has evidently bestowed much pains on the determination of his instrumental constants, and this publication of results contains a valuable contribution to our knowledge of the magnetic laws for an important station, near the most southerly and westerly point in Europe. Lisbon, like nearly every other magnetic observatory, has been obliged to be satisfied with single instruments of each kind. When so many observatories were founded between thirty and forty years ago, there was perhaps an over confidence in the excellence of the instruments employed, and in the certitude of being able to correct the observations to be obtained from them for every possible error. There was also the economical consideration connected with the expense of a double series of instruments, as well as the additional labour incurred in observing two instruments for the same purpose. The consequence has been, to take a single illustration, that no two observatories have given exactly the same law for the annual variation of the mean position of the magnetic needle. One observatory has contradicted another, the results from a good instrument have been balanced by those from a bad one, and in other cases it has not been possible to determine whether the differences found at two stations were really due to difference of locality only, or to instrumental causes.

When we remember the vast labour (to omit every other consideration) expended in obtaining the laws of magnetic variations, it cannot be too much regretted that every observatory was not furnished with a double series of instruments, which would have shown by their agreement or disagreement the accuracy or error of the results obtained from them. In the case of disagreement the director of the observatory would have been warned that some error existed whose cause should be sought out. No preliminary trials can ensure that an instrument will remain with exactly the same errors. If we could suppose that the captain of a ship would set sail on a lengthy and costly voyage with a single chronometer, without any means of verifying the accuracy of its going except the meeting with another ship in a like predicament, and should then find that, according to their chronometers, they were on opposite sides of the globe, we should have a parallel to a not uncommon case in the work of many magnetic observatories.

It is to be hoped for the future that such differences will not be allowed to exist, that each observatory will have the means of proving that, for its locality at least, the laws obtained are true, and that in publishing the observations, the differences of the indications of two instruments of each kind will be given with the most complete exposure of their errors and corrections.

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#### MARSDEN'S "NUMISMATA ORIENTALIA"

*Marsden's International Numismata Orientalia.* Part II. Coins of the Ursuki Turkomans. By Stanley Lane Poole, Corpus Christi College, Oxford. (London: Trübner and Co., 1876.)

THIS is the second part of the series of separate publications on the Early Coins of the East, of which the first part on Ancient Indian Weights was reviewed in NATURE, vol. xii. p. 24. The whole work is intended to be a new edition of Marsden's "Numismata Orientalia," but in consequence of the new form of the work and its enlarged character, the editor has changed its title into that of the "International Numismata Orientalia."

Part II. has been undertaken by Mr. Stanley Lane Poole, and treats of the Coins of the Ursuki dynasty. Ursuk was one of the petty chiefs of Syria during the wars of the Crusades, in which he distinguished himself, and was made Governor of Jerusalem, A.D. 1086. His descendants, the Ursuki princes, were amongst the most powerful chiefs in Syria and Mesopotamia, until the dynasty was brought to a close by the Tartar invaders, A.D. 1242. An historical sketch of the Ursuki family is given by Mr. Poole as an introduction to the account of their coins.

The series of Ursuki coins described in the work, the greater part of which are now in the British Museum, are mostly copper coins, a few only being of silver. Several plates with clear lithographic and photographic representations of the coins form part of the work. The coins all bear Arabic inscriptions, some of considerable length, and they appear to be of much historical value. In the description of the several coins in the text of the work the old Arabic inscriptions on each coin are given in the more modern Arabic character, according to the system of transliteration adopted in the book. These inscriptions are, however, intelligible only to Arabic scholars, as no English translation is given, which would have added considerably to the interest of the work for general readers.

At the commencement of the Ursuki dynasty the Mahometan moneys were of three classes—gold, silver, and copper, the respective units being the *dinar*, *dirhem*, and *fels*. But the Ursuki coins, both copper and silver, appear to be *dirhems*, this word appearing in the inscription of many of the coins, and showing that they were intended to pass as *dirhems*. Some of the copper coins have a thin coating of silver, and one has been gilded.

The Ursuki princes were amongst the few Mahometan dynasties that introduced images on their coins. But they rarely, if ever, engraved their own heads or those of their suzerains on their coins, choosing instead the types of the gold coins either of the Byzantine Emperors or of the Greek Kings of Syria.

The few silver coins of the series weigh about 44 grains, or 2.9 grammes each. The copper coins vary in weight from 43 to 163 grains, or 2.8 to 17.0 grammes.

The Arab systems of money and of weight are treated at great length in Queipo's "Systèmes Métriques et Monétaires des Anciens Peuples." The earlier gold unit was the *dinar*, and the later gold unit the *nichtal*. The *dinar* was the monetary unit, from the Roman *denarius*. The *nichtal*, which signifies weight, was the unit of monetary weight. Queipo gives a list of 263 gold dinars of the ancient Eastern caliphs which are now in various numismatic cabinets, with their weights. No coins were struck by Mahomet and his successors, who used the existing coinage of the countries, until the 78th year of the Hegira, when both gold and silver coins were struck by Abdelmelik, Caliph of Bagdad. The mean or normal weight of the gold *dinar* was 66 grains, or 4.25 grammes. This was the weight of the Attic drachma, from which it was evidently derived. There were also gold coins of  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ , and  $\frac{1}{5}$  *dinar*.

The relation of the weight of the Arab silver *dirhem* to the gold *dinar* was as 7 to 10, or nearly as 2 to 3. Queipo gives a list of 592 Arab silver *dirhem* coins of Arabian caliphs from A.D. 699 to 1195, with the weight of each coin. This varied from about 2.5 grammes in the earlier part of this period up to a maximum weight of 3.1 grammes in later times, the mean weight of the *dirhem* being 2.84 grammes, or 44 grains. He mentions also silver coins of  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{4}$  *dirhem*. The half *dirhem* was thus nearly equivalent to our Saxon penny, the  $\frac{1}{20}$ th of a pound of silver, and weighing 22½ troy grains.

Queipo makes but little mention of the Arab ancient copper moneys, except to throw a doubt on the existence of the *fels* as a copper coin, and to assume that it was only money of account, and also that the number of *fels* in a *dirhem* expressed merely the number of units corresponding with the value of copper in relation to silver. He shows that in the first centuries of the Hegira, the value of silver to gold was as 1 to 13, and of copper to silver as 1 to 120. If, therefore, a gold *dinar* weighed 4.25 grammes, its equivalent in copper would weigh 6,630 grammes; and as the number of *fels* in a *dinar* could not have exceeded 98, that this would give the improbable weight of 67.65 grammes to each copper *fels*. This was the weight of the Attic drachma, from which it was evidently derived. There were also gold coins of  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ , and  $\frac{1}{5}$  *dinar*.

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#### VAN BENEDEN'S "ANIMAL PARASITES"

*Animal Parasites and Messmates.* By P. J. Van Beneden, Professor at the University of Louvain, &c. (London: Henry S. King and Co., 1876.)

THIS work forms the twentieth volume of the International Scientific Series. We believe there was some doubt on the part of the publishers as to the propriety of bringing out a popular treatise on so uninviting a subject. To have omitted all account of this important series of creatures considered in relation to the welfare of man would, however, have been a serious blunder. It is high time that popular prejudices should be ignored, especially when the welfare of the people themselves is involved in the question at issue. Fully alive to the prejudices referred to, a writer in *Notes and Queries* (who was probably anxious to make the subject palatable) says of this little book: "There is as much amusement to be derived from Prof. Van Beneden's pages as there is instruction." We cannot take this optimist view of the matter; on the contrary, we fail to find anything amusing in the book, although, as might be expected from the author's known position as a man of science, there is much to be learnt from an attentive study of the text. Prof. Van Beneden's strength lies in a clear exposition of the phenomena of commensalism. We owe to his remarkable zoological acumen the correct interpretation of those singular phases of parasitic life which he has so happily classed under the rôle of Messmates and Mutualists, respectively. On this head he has strung together such a multitude of facts that his work cannot fail to be useful to working naturalists. Whether the general reader will find anything "amusing" in these pages is very doubtful. He may, indeed, if his mind be still dominated by the teachings of a certain school, find comfort in the assurance which M. Van Beneden affords that the welfare of all the most repulsive forms of insect life is most carefully looked after. What a comfort it must be for the poor Cayenne convict when tortured by insect parasites to know that the ever-helping "Hand" superintends the "preservation" of the larvæ of *Lucilia hominivora* with the same care that it does "the young brood of the most brilliant bird." Surely the Mexican soldier who "had his glottis destroyed, and the sides and the roof of his mouth rendered ragged and torn, as if a cutting punch had been driven into those organs," could hardly be brought to realise the need-be for such a process of development on the score of benevolence towards this frightful parasite! The case of *Lucilia* is by no means exceptional, since there are scores of parasites, both external and internal, that are capable of inflicting the most terrible sufferings alike upon man and beast. Push our author's Bridgewater-treatise-like views to their logical outcome, and it necessarily follows that every pang endured by countless